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The New Jersey Highlands.

THE annual report of the State Geologist of New Jersey, which has just been published, contains an interesting chapter on "Natural Parks and Forest-reservations." The action of the Massachusetts Legislature, in creating a Park Commission to consider the advisability of providing open spaces in the vicinity of the towns near Boston, suggests an examination of the natural features of the northern part of the state of New Jersey, which lies so close to a dense population, and from which large cities like Newark, Paterson, Jersey City and Orange secure their water-supply. Inasmuch as one of the primary uses of a geological survey of a state is to discover and set forth its natural advantages, this subject is quite a legitimate one. Attractive scenery, well-watered and health-giving places of residence and resort are certainly natural resources which have a value quite as real as that of a bed of ore or of marl or a quarry of marble. These physical features are part of the wealth of the state, and, as Professor Smock explains, the development of these resources is one of the eminently practical benefits which ought to come from official studies and surveys.

The northern part of New Jersey is traversed from north-east to south-west by the ranges of the Appalachian system which are nearest the sea. On the extreme north-western border of the state are the Blue, or Shawangunk, Mountains, through which the Delaware breaks at the Water Gap. This range forms one boundary of the beautiful Kittatinny Valley, which opens into the Delaware in one direction and the Hudson in the other, embracing most of the counties of Warren and Sussex, a region of fertile farm-land of singular pastoral beauty. The New Jersey Highlands, so-called, which bound this valley on the south and east, are a broad belt of mountain-land, extending across the state and consisting of many comparatively short parallel ridges, which rise to a height of a thousand or fifteen hundred feet. The valleys of these Highlands are gemmed with beautiful lakes, the slopes of the mountains are covered with luxuriant tree-growth, and the scenery has that varied beauty which is always found in a country of lakes and forests, sparkling streams and rugged hills. The mountains have not been blackened and blasted by fire, and although most of the original wood has been cut away, there is healthy timber growing everywhere, except on the crests of the rockiest ridges. The lakes and streams are well stocked with fish and the woods with game, so that altogether there are many portions of the Highlands which seem peculiarly adapted to use as public parks or as state forests.

But the peculiar value of this region lies in its accessibility. A circle of less than thirty miles, with its centre at Newark, would take in its entire chain of lakes and nearly all of the most beautiful of its mountain scenery. The very heart of the Highlands is less than forty miles from the New York City Hall. It is difficult to imagine that so much wild wood scenery, such a stretch of untamed country, and so many forest-bordered mountain-lakes still remain in much of their primitive beauty so near to great masses of population. It can hardly be hoped that these woods will much longer resist the demand for lumber and fuel, or that this region can much longer remain unpopulated; and, therefore, the recommendation to preserve some of its more remarkable natural features, and hold them under some associated or public supervision, is a timely one. The reservation of large forest and mountain areas in remote parts of the country is certainly commendable, but it would seem that this mountain-belt of New Jersey, where there are so many tracts which are available for use as public pleasure-grounds, and near enough to afford ready resort for the great population which clusters around New York Bay, ought not to be overlooked, and that some effort should be made to preserve a part of these Highland ranges for the pleasure and health of the people. Professor Smock calls attention to the fact that the recently established Algonquin Park, in Ontario, occupies a territory which, in its topographic and geologic features, resembles the New Jersey Highlands closely, and a section of them would well serve the purpose for which this park in the northern wilderness has been reserved; and that purpose, as set forth in the language of the act creating the reservation, is "to be a public park, forest-reservation, fish and game preserve, health-resort and pleasure-ground for the benefit, advantage and enjoyment of the Province of Ontario."

ALMOST every year some one steps forward to assert that the Chrysanthemum has passed the zenith of its popularity, and that it will soon take its place among the flowers which were once fashionable, but which are now, like the Camellia, for example, almost entirely neglected. But the exhibitions of which we have lately given an account, and many others which we have not had space to mention, have this year been unusually well attended; the flowers have been better than ever before in richness of color and refinement of form, and the limit of possible improvement seems as distant as ever. The fact is that the flower possesses in itself such positive merits that its position is assured beyond any cavil. It lends itself so well to various kinds of decoration that it cannot be displaced by any other plant in cultivation; it is grown with comparative ease, flowers profusely, and lasts well under conditions which are usually injurious to plant-life. But, most of all, it comes at a time of year when rivals are few, lasting through a long period, and fills completely a season when flowers are few, which without it would be dreary enough.

The plants grown to a single stem and carrying a single flower are in themselves unattractive, but a dozen or two of these flowers in a large vase make a decoration of the most imposing kind, and since prizes have been given for this class the exhibitions have had a new interest. It seems strange that the Anemone-flowered varieties are so little used to produce effects of this sort, and perhaps the next sensation will be in this direction. We have seen nothing more beautiful this year than a group of these flowers on long stems. They are not at all inferior to the other kinds in

richness of coloring and in variety of form, and they cannot much longer remain in the background. The tightly incurved varieties are evidently no longer esteemed as they once were. Skillful growers who wish to show what can be done by patient care will continue to present occasional examples of their skill in this direction, for it requires the highest art to grow one of these deep flowers to perfection. But it is plain that modern taste approves of Japanese sorts with more flowing lines and a somewhat wayward deviation from regular mathematical curves.

The trained plants, which show on a perfectly symmetrical bush a hundred or so flowers all at their best on a given day, certainly show the gardener's art at its best, and the plants exhibited this year at Boston and Philadelphia have never been excelled. No one can help admiring them, although they are in a certain degree as artificial as possible, and they must always be rarities. Quite as interesting to most people were the small plants naturally grown shown in the New York show in five-inch pots, each one with about a score of blooms. These plants set a pattern to the ordinary grower which is not at all discouraging, and, perhaps, the amateur can get the most pleasure out of his Chrysanthemums by growing them in rather larger pots, out-of-doors, and sheltered somewhat from the wind, where they will become sturdy and have a solidity and substance which no plant which is tenderly nurtured under glass ever possessed. These plants may be carried through early frosts, protected by a light cloth cover, and up to Thanksgiving can be set on terraces and piazzas out-of-doors, where their bright colors and bold carriage show to the best advantage in the frosty air under which all other vegetation has withered. It ought not to be forgotten that many varieties whose flowers, when grown to enormous proportions on a single stem, do not quite satisfy the taste, produce a singularly good effect when grown in this way. Mrs. L. C. Maderia offers, perhaps, the most perfect type of a solid globular flower, and it is always seen at a disadvantage among the more graceful Japanese kinds. But when grown on small plants, and the little golden balls are not more than an inch or an inch and a half in diameter, they have a beauty of their own which is quite distinct. The same is true of many oddities like Cashmere, with its thread-like florets. Among seedlings a large proportion of single-flowered varieties are always found, and these are generally discarded. Some of the single flowers, however, have a rare attractiveness in form and color. The plants are usually strong, and a well-flowered specimen of such a variety as Daisy, for example, always commands admiration. In fact, there is almost an endless field for study in this wonderful plant, and although new varieties are produced so rapidly that no one can keep a record of them, it would seem that there is hardly one which has not something to commend it, or which cannot be made useful by some method of cultivation.

Slow-maturing Fruits of Trees and Shrubs.

THE generally accepted idea of inflorescence and fructification seems to be that flowers are produced in spring and summer, with mature fruits and seeds following before winter sets in. Observing persons, however, although not botanists, must have noted deviations from the common rule of annual fructification in some of our native woody plants which do not mature their fruits in the same season in which the blossoms are produced. Where it is indigenous, perhaps one of the best-known examples of this kind is the Witch-hazel, Hamamelis Virginiana, whose conspicuous yellow flowers and simultaneously maturing woody fruits must attract attention. After flowering in the autumn the fruit-producing portion of the blossom practically makes no further growth, but remains dormant until the following spring, and then develops rapidly, maturing at the next flowering in the autumn.

It is less generally known that the beautiful late-flowering Franklinia, Gordonia Altamaha, has a similar habit. The plant at the Arboretum, which always requires protection in winter, matured some woody fruit capsules for the first time, so far as observed, when the plant was in bloom in October, these fruits resulting from last year's flowers. No good seeds were found, however, and the embryo of this plant is still unknown. The time of its fructification was noted by Bartram in his *Travels* (1792), page 465, where he says: "After my return from the Creek Nation I employed myself during the spring and fore part of summer in revisiting the several districts in Georgia and the east borders of Florida, where I had noted the most curious subjects, collecting them together and shipping them off to England. In the course of these excursions and researches I had the opportunity of observing the new flowering shrub, resembling the Gordonia, in perfect bloom, as well as bearing ripe fruit."

The Gordonia to which he likened this shrub was the earlier-known Loblolly Bay, Gordonia Lasianthus of the south. A third plant, having the habit of blooming in the autumn and maturing its fruit in the following autumn, is the Sea-side Alder, Alnus maritima. The pretty staminate catkins elongate and shed their pollen in September, the little-fertilized, cone-like fruits developing very slightly before frost, and only fully maturing in the following autumn.

The fact that all Oaks do not ripen their acorns in one season is more generally known, and yet many intelligent persons hear the statement with surprise. All the native White Oaks do mature fruit in the same season in which the blossoms are produced; but the Red Oak, Scarlet, Black, Pin, Shingle and other Oaks belonging to the Black Oak section, having bristle-points to the lobes of the leaves, do not fully develop their acorns until the autumn of the second year after blossoming, the flowering of Oaks being in May or early June. At the end of the first summer's growth the little fruits appear to have made scarcely any advancement, and much resemble very short spurs or branches with a thickened tip, and do not bear much likeness to acorns. A cross-section of the fruit at this time also fails to show any clear separation between the seed and seed-coverings and cup. In the following spring there is rapid development and distinction of parts. As a rule, these Black Oaks blossom rather earlier in the season than the White Oaks and the trees grow faster, and that they should require twice as long to bring their fruits to maturity seems a rather strange rule of Nature.

The true Pines form another group of trees whose fruit remains on the plants at least through two summers and one winter before the seed is ripe. In some species the cones do not make much growth during the first summer; in others they grow to nearly one-half of their ultimate size. One or two or more foreign or other species not hardy in this climate, are said to require three seasons of growth before the cones arrive at maturity. The ultimate size of the cones of the species makes no difference as to the length of time required for maturation. This is well shown by the giant Sequoias of California, whose small roundish cones are reported as not being ripe until the second season.

With the exception of the Junipers, the plants or genera mentioned include the only American ligneous species known to be biennial-fruited, or which do not ripen fruit before winter from blossoms of the season.

The various species of Junipers show within this genus wide differences of time required before the fruit arrives at perfect maturity, and a consultation of authors who have referred to this point is likely to cause confusion, because of apparently contradictory statements. Dr. George Engelmann, in classifying the American species of the section Sabina, states that they are biennial-fruited. Other authors have followed this statement or have called them annual-fruited. We have three species of Juniperus east of the Mississippi River in North America, and an examination of them shows that each requires a different length of time before the little berry-like fruits, or galbuli, are fully mature.

The common Red Cedar, or Savin, Juniperus Virginiana,

one of the most widely distributed of North American trees, is found to be annual-fruited. In New England it flowers about the latter part of April, and the little blue berry-like fruits are fully ripened in October. They remain on the plants throughout the winter, or until eaten by birds, which find them an important article of food when the ground is covered with snow.

The so-called Trailing Savin, Juniperus Sabina, var. procumbens, is naturally a rather uncommon plant in the east, but farther west it becomes more abundant. Numerous fruiting specimens, kindly furnished by Robert Douglas & Son, Waukegan, Illinois, show that this species requires two summers of growth before the fruit is ripened.

The third eastern American species is the low-growing common Juniper, Juniperus communis, so abundant in many neglected pastures and on rocky hill-sides, and well known as a native of Europe and Asia, as well as northern America. A careful examination of fruiting plants of this species will show that the fruits are not ripe at the end of the second year after flowering, and that they must have a third summer to bring them to full maturity. This species blossoms about a month later than the Red Cedar, the flowers appearing singly in the upper axils of the leaves on shoots of the previous season's growth. As in the case of the Black Oaks, very little development is manifest during the first summer, and in the autumn the young fruits are not much larger than they were at flowering time. It is during the second season that nearly all the growth takes place, and the little galbuli will be found to have enlarged considerably before the regular blossoming time returns. In the second autumn they are nearly full-grown, but still green. During the third summer complete development is accomplished, and by the end of August or early September we find the so-called berries soft, sweet and ripe. A fruiting branch of this species, with its ripe blue or purple fruit and green fruit in two stages of development, forms an interesting study. In this case we are enabled to tell more than two years in advance whether there is likely to be a crop of fruit; and the Black Oaks and Pines show clearly in summer the probabilities for a harvest of seed in the autumn of the next year.

Arnold Arboretum. *J. G. Jack.*

Oregon Autumn Notes.

ONE who is accustomed to the changes of seasons in the east is disappointed when looking for the beautiful tints of autumn in the foliage of the trees of western Oregon. Instead of the bright reds and yellows which paint with splendor the mountain-slopes of a New England landscape, our deciduous trees present a monotony of dull yellows and browns, which is at first unsatisfying. The trees which give the character to the landscape on the low lands are chiefly the Garry Oak, Quercus Garryana; the Oregon Ash, Fraxinus Oregana, and the Big-leaf Maple, Acer macrophyllum, of the deciduous kind; and of the cone-bearers, the White Fir, Abies grandis, with the Douglas Spruce, Pseudotsuga taxifolia, on higher situations. When seen from a little distance the yellows of the Ash and Maple and the brown of the Oak are beautifully contrasted with the dark green of the White Fir, and their brighter coloring and bold outlines set them out in strong relief from a dark green background of Douglas Spruce, softened by a blue haze.

But our autumn landscapes are not entirely without bright colors, for here and there the eyes are greeted by a cluster of the brilliant crimson and scarlet leaves of the Vine Maple, Acer circinatum, which grows plentifully as underbrush both in the bottom-lands and on the hill-sides. The graceful habit of the dark green procumbent or ascending stems, and the peculiar set of the leaves, give this small tree a striking appearance, and it would make a valuable addition to eastern gardens if it can be successfully cultivated there. The season is now rapidly advancing, and the fallen leaves of the Big-leaf Maple, which is much used as a shade-tree, are strewn plentifully over the ground. Nor is the name Big-leaf a misnomer. One now on my table measures in total length nearly thirty inches, the petiole being half as long, and its breadth nineteen and a quarter inches. The largest leaves are found on young sprouts after a severe pruning. At higher elevations, and in the denser shade of Spruce and Cedar, Thuya gigantea, the leaves of the Vine Maple are still a vivid green, while those of the Arrow-wood, Spiræa discolor, var. ariæfolia, and of the Hazel, Corylus rostrata, var. Californica, are rapidly fading and falling. The Dogwood, Cornus Nuttallii, too, is losing its foliage, but bears in its place a rich harvest of bright red berries, which are eagerly sought by the birds. Here and there, in open spots, grows the cosmopolitan Brake, Pteris aquilina, to a height of six feet, throwing into the air a shower of spores and sporangia at every step.

In the gardens the Roses are in full bloom, and will continue into late November. Since the advent of the autumn rains the grass has flourished, and the lawns are showing a lusty green. Altogether, the autumn here has charms of its own which are well worth grateful recognition.

Forest Grove, Oregon. *Francis Ernest Lloyd.*

Notes on the Forest Flora of Japan.—XXV.

IN Japan, Junipers are much less common than they are in eastern America, and although five or six species are included in the Floras of the empire, the genus does not make an important element of the landscape, and one misses the dark spires which Juniperus Virginiana sends up so frequently in many parts of eastern America. Juniperus Chinensis appears to grow to a larger size than the other Japanese species, although we only saw it in one region growing, as it appeared, without cultivation. This was on the high volcanic ridge which dominates the Chikuma, one of the streams which flow from Asama-yama, in central Japan. Over this elevated and inhospitable region occasional Junipers are scattered, the largest attaining a height of thirty or forty feet, their wind-swept heads and straggling branches covered with gray-green foliage, adding to the dreariness of the scene. Before the Buddhist temple of Zenkōgi, in Nagano, the principal city in this part of Japan, two venerable Junipers show to what a size plants of this species can grow, and how picturesque they can become. These trees are seventy or eighty feet high; their hollow trunks, which are rather more than six feet in diameter, support narrow heads of twisted and contorted branches clothed with scanty foliage, and indicate that centuries may well have passed since the roots of these marvelous trees first penetrated this sacred soil. On the rocky cliffs and grassy slopes of the coast, fully exposed to the spray of the ocean, a prostrate form of Juniperus Chinensis forms, with its long creeping stems, dense mats, often of considerable size. It is said to be a feature of the littoral vegetation of Japan, but we only saw a few plants in Yezo, between Morroran and the Aino village of Horobetsu, where they receive the unbroken sweep of the Pacific. On the sandy dunes of the Bay of Hakodate, opposite that city, another littoral Juniper was found by the American botanist Charles Wright, and later by Maximowicz. This is the Juniperus conferta of Parlatue (Juniperus littoralis of Maximowicz), a species distinguished by its stout crowded leaves and large globose fruit. We saw it on Hakodate Bay at the end of September, and Mr. Veitch collected it earlier near Hanjo, on the west coast of Hondo, but we were too early to obtain ripe fruit of this species or of the prostrate form of Juniperus Chinensis. The only other Juniper we saw in Japan, Juniperus rigida, is a small tree sometimes twenty feet high, but more often a low spreading bush. It is common in the barrens near Gifu, and appears to be generally distributed at low elevations in central Japan, although it only grows on dry, sterile, gravelly soil. This is the Juniper which is most commonly cultivated by the Japanese, and is not infrequently an inhabitant of temple-gardens. Its long, slender, rigid leaves and small fruit, tipped with a minute mucro, serve to distinguish it from Juniperus conferta.

Of the true Pines of Japan two species are valuable timber-trees; these are Pinus densiflora and Pinus Thunbergii; both bear an important part in the decoration of Japanese gardens, and one at least has had its influence in all expressions of the artistic temperament of the people. All the Pine-woods of Japan, except those found on the upper slopes of some of the high mountains of central Hondo, have evidently been planted. Such planted woods are often seen covering sandy plains near the coast, and the

principal highways of the empire are shaded by avenues of these Pines, except where Cryptomerias replace them when mountains are crossed. Of the two species the Black Pine, Pinus Thunbergii, appears to be the most commonly cultivated, and grows to the larger size. Of its distribution and appearance growing naturally I was able to get no idea, as all the plants I saw had evidently been planted by man. It is of this species that the plantations of the coast are mostly formed, although the two species are generally found mixed together in all plantations; and it is this species which is usually selected by the Japanese gardener when he wants to make the branches of a Pine-tree cover an arbor or hang suspended over the sides of a moated wall. It is this species which is found in every garden and which is most revered by the Japanese. Pinus Thunbergii is one of the most picturesque of Pines, with a broad head of stout, contorted, somewhat pendulous branches, often growing to the height of eighty feet, and producing trunks three feet through. Its dark, deeply furrowed bark, darker-colored and thicker leaves and white buds serve to distinguish it from the Red Pine, Pinus densiflora, which is a tree of high elevations, and which, although planted in large plantations and by the sides of highways, does not appear to be such a favorite in gardens as the Black Pine. The Red Pine we saw growing wild high up on Mount Koma-ga-take, in central Hondo, and on the Nikko Mountains, where, at about three thousand feet over the sea-level, it is not rare. It is a more slender tree than the Black Pine, with thinner, lighter green leaves. The bark on the upper part of the trunk and on the main branches is light red, separating in thin scales, so that a forest of these trees presents a bright and cheerful appearance. Several varieties of the two species recognized by Japanese gardeners are described by Mayr, who also found what he thought was a hybrid between them.* The wood of the two species is very similar, and, apparently, is not distinguished in Japanese lumber-yards. It is coarse-grained, resinous and moderately strong, and is used in great quantities in all sorts of coarse construction, and as fuel, the rapid growth of the trees on soil too poor to produce more valuable crops to advantage rendering it exceedingly cheap. These two Pines have long inhabited our gardens, where they are hardy and grow with great rapidity, some of the oldest plants of the Red Pine here already beginning to show the picturesque habit which in their native country is the charm of these trees.

The other Pines of Japan belong to the group in which the species produce their leaves in clusters of fives. The largest and the most widely distributed is Pinus parviflora, a beautiful small tree of high mountain-forests, through which, at elevations above five thousand feet over the sea-level, it is found scattered, either singly or in small groves, sometimes growing to a height of sixty or seventy feet, although it is usually much smaller. In those parts of Japan which we visited, it was most common and grew to the largest size on the slopes of Mount Hakkoda, in northern Hondo, where its dark pyramidal heads of slender spreading branches, rising above the forests of Oaks and Beeches, break the sky-line, just as its relative, our eastern White Pine, raises its noble head high above the Oak forests of New England. The wood of Pinus parviflora is soft, straight-grained, light-colored and of considerable value, but so difficult to obtain that it is little known or used by the Japanese. This beautiful Pine flourishes in our gardens, where it appears to be perfectly at home and where it grows rapidly and every year covers itself with cones.

In southern Yezo, a second species of the same group, Pinus pentaphylla, has been distinguished by Mayr. This is an exceedingly rare tree, found in a few isolated situations and distinguished from Pinus parviflora by its longer cones and stouter leaves. We only saw a cultivated tree at the hot-springs of Kakumi, near the shore of Volcano Bay, being prevented by bad weather from reaching a small grove of these trees growing on the mountains in the neighborhood. This Pine has not been introduced into our gardens, where it may be expected to flourish.

The fifth Japanese Pine is interesting from the fact that it is the only Japanese Conifer which grows naturally in North America. It is the Pinus pumila of Regel, a species so similar to the Stone Pine of Europe that by many authors it has been considered a variety of that tree. We only saw it on the summit of Mount Hakkoda, where it forms, at six thousand feet above the sea-level, impenetrable thickets a few feet in height and hundreds of acres in extent; it occurs on the summits of some of the high mountains of Yezo, ranges north through Saghalin and eastern Manchuria to Kamtschatka, and by the Kurile Islands reaches those of the Alaska coast.

Of Spruces, there appear to be four species in Japan, where, except, perhaps, in some parts of Yezo, they are exceedingly rare. The first, Picea polita, we only saw in two or three individuals in the Nikko Mountains, on the hills below Lake Chuzenji. The trees were small, much torn and stunted by the wind, and of such a miserable appearance that it was difficult to realize that the young trees in perfect health and beauty which decorate our gardens belong to the same species. For the second Spruce of the mountain-forests of central Hondo, to which it appears to be confined, Mayr proposes the name of Picea bicolor, this specific name having, he finds, been first used by Maximowicz for this tree. This is the beautiful Spruce with blue-green leaves, silvery white on the under surface, which is usually cultivated under the name of Picea Alcockiana, and which is easily distinguished in the spring by the bright red color of the young shoots.

It is not my purpose to discuss here the synonymy of the Japanese Firs and Spruces, upon which such a mass of names have been heaped in almost hopeless confusion, that only a critical examination of all the specimens which have been studied by European botanists can make it possible to reach any useful conclusions on the subject, and I shall only speak of the trees as I saw them growing in the forests of Japan. Picea bicolor, of which we only saw three or four specimens, is evidently a rare and local tree, found only at high elevations, scattered through the Oak and Beech forests, and, like Picea polita, presenting in its home a wretched and forlorn appearance. The leaves are nearly equally four-sided, and the cones are four to six inches long, with narrow, pointed, more or less laciniate scales. These two species, so far as I was able to observe, are the only Spruces which grow on the island of Hondo, the other species finding in Yezo their most southern home. They are Picea Ajanensis, a tree with smaller cones than the last, and short, broad, flat leaves, dark green above and pale on the lower surface. This is the common Spruce of Yezo, occurring on the hills near Sapporo, which is the only place where I saw it, in isolated individuals scattered through the forests of deciduous trees. According to Mayr, this tree forms in the western part of the island considerable forests on low swampy ground, not much raised above the level of the ocean. This appears to be the common Spruce of Saghalin and of the Manchurian coast.

The fourth species, Picea Glenhi, discovered by F. Schmidt in Saghalin, has been found in a few situations in southern Yezo. This tree, which is still to be introduced into our gardens, we did not see growing. In many characters it resembles the Siberian Picea obovata, and in the herbarium it is not easy to find characters by which it can be satisfactorily separated from that species. Like the White Spruce group of North America, in which species appear to pass one into another by gradual transitions, the Spruces of north-eastern Asia are difficult to distinguish with the material found in herbaria, and it will only be possible to study them satisfactorily when all the various forms have been planted side by side in some arboretum and allowed to grow to maturity.

Of the Hemlocks found in Japan, one is northern and the other southern; both are common at high elevations,

* Die Abietineen des Japanischen Reiches.

and one at least forms extensive forests. The great forest, which covers the Nikko Mountains at an altitude of more than five thousand feet above the ocean, is composed almost entirely of the northern Hemlock, Tsuga diversifolia, which is distinguished by its bright red bark and by its small leaves and cones. This Hemlock forest, which is the only forest in Hondo which seems to have been left practically undisturbed by man, is the most beautiful which we saw in Japan. The trees grow to a great size, and while they stand close together are less crowded than the trees in an American Hemlock forest under which no other plants can grow, and light enough reaches the forest floor to permit the growth of Ferns, Mosses and many flowering under-shrubs which clothe the rocky slopes up which this forest stretches. One of the most beautiful spots which we saw in Japan is the walk cut through this forest which follows along the shores of Lake Umoto, and we are fortunate in being able to reproduce here a photograph of this spot, for which we are indebted to Professor Mayr, of Munich, who, during an official residence of several years in Japan, explored the forests of all parts of the empire more thoroughly than any other foreigner. We found Tsuga diversifolia in scattered groups on the rocky cliffs of Mount Hakkoda, in the extreme north of Hondo, the most northern station which has been recorded for this tree, which is still to be introduced into our gardens; but, south of Nikko, it was replaced by the second species, Tsuga Tsuga, which we saw in great beauty on Koma-ga-take, where, however, it does not form a continuous forest, but is scattered in groves of considerable extent among deciduous trees and Pinus densiflora. It is this southern species which is cultivated in our gardens, where it appears to be as hardy as our native species, which it surpasses in its more graceful habit, and in its broader and darker-colored leaves.

C. S. S.

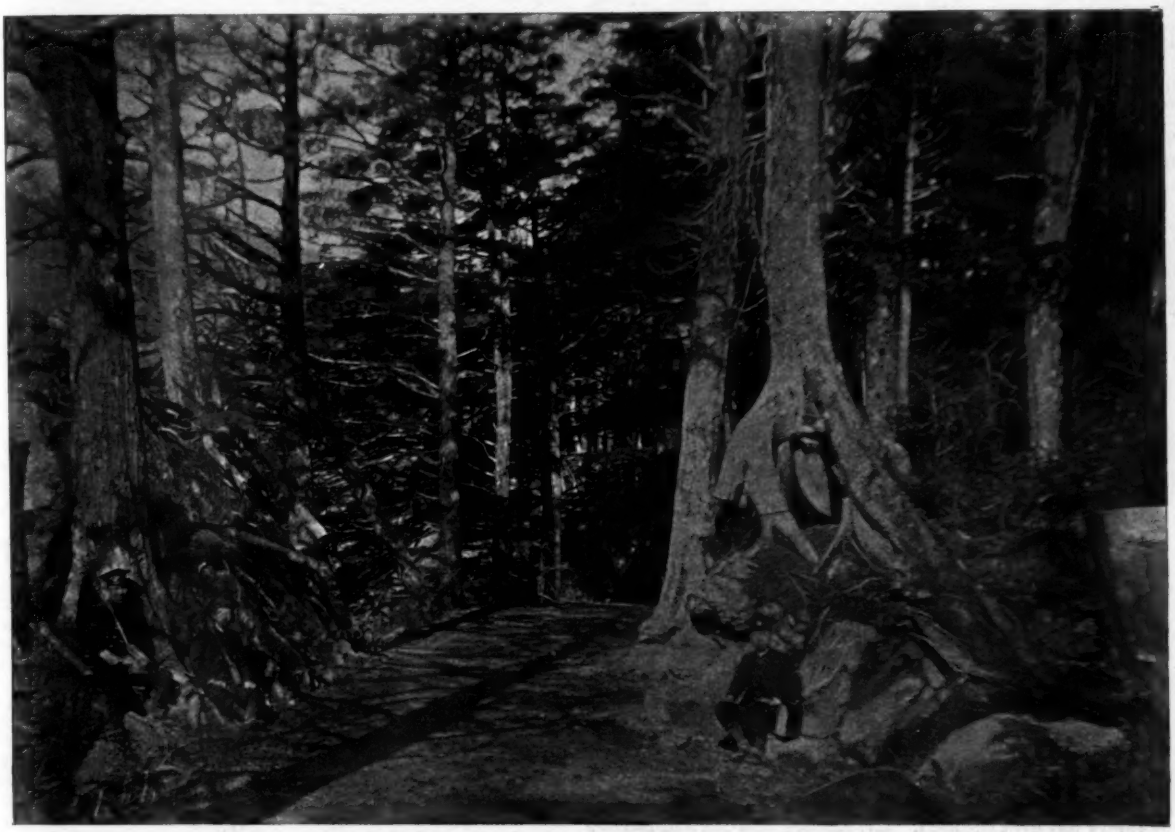

Fig. 73.—A view in the Forest of Hemlock (Tsuga diversifolia) in the Nikko Mountains, Japan.—See page 493.

Cultural Department.

Does Mulching Retard the Ripening of Fruits?

IT has often been recommended to cover the ground about Peach-trees with a heavy mulch in winter for the purpose of delaying the blossoms which might otherwise be caught by early frosts. The theory seems to have been that if the ground is kept cool and the roots dormant no nutriment will be furnished for the development of flowers and early leaves. It is a well-known fact, however, that when the branch of a Rose-bush or an Apple-tree is let into a warm room through the window the buds will start in a few days, even though the ground outside is frozen hard and the temperature is down to zero. This would seem to prove that the starting of any tree depends upon the temperature of the air about the buds rather than of the ground about the roots, and, indeed, it is well known that trees store up in their branches every year material which is to be used for the growth of the new buds in early spring, just as starchy matters are stored up in bulbs one year for the production of flowers in the next. An illustration of this fact is often given by cutting twigs from early-flowering shrubs or trees in the winter and placing them in vases of water, when they will often flower if kept at the proper temperature. Nevertheless, the discovery of any method of delaying the flowering season would be of value by preventing the danger from late spring frosts, which kill the fruit-blossoms, and by enabling commercial fruit-growers to market their products when there is less competition than usual, and as the chief competition in the middle states comes from the south, the delay of a fortnight in ripening a crop might mean a considerable addition to its price.

With these facts in view, the Experiment Station at Cornell

University made several tests in mulching, under the direction of Professor Bailey, last winter. The winter was very severe, and after the ground had been frozen deeply and well-settled snow lay a foot deep in the open fields, coarse manure and litter was placed about Apples, Raspberries, Currants, Grapes and other fruit-plants. Half a wagon-load was placed about each tree, and the snow was covered thickly for a distance of more than three feet in every direction. Small fruits were mulched heavily to the middle of the rows, or three and a half feet in each direction. A heavy wagon-load of mulch was used on about ten feet of the row. On the last of March, although the frost had left the field ten days before, the earth under the mulch was still solidly frozen, and there were from six to eight inches of snow remaining, and yet on the 13th of April, while there was still frost and snow under the Gooseberry mulches, the treated and untreated plants seemed to be starting absolutely together, and this, too, when the buds on the lower part of the bushes under the mulch were entirely dormant. These mulched plants maintained their forwardness and produced leaves, flowers and fruit at the same time with the contiguous plants which were not treated at all, and the same thing was true of Crandall Currants, Juneberries, Roses, Grapes and all the orchard trees. The Blackberries, Raspberries and Victoria Currants seemed to be a day or two later in starting, but they soon caught up, and there was no difference in the season of bloom or of maturing the fruit.

With Strawberries the case was different. They were mulched in the spring, after the ground had been thawed out and the plants were entirely covered to the depth of three inches. A month and a half later the mulch was removed, when the untreated plants were in full leaf and about ready to bloom. The plants under mulch were then just breaking into leaf and the growth was weak and bleached, although they were endeavoring to push through the covering to the light and air. After the mulch was forked away from the plants they gradually assumed a normal color and bloomed on the first of June, or from ten days to two weeks later than the others. The fruiting was delayed about a week, although the plants never recovered entirely and the yield was somewhat lighter. Of course, the difference in the behavior of Strawberry-plants was owing to the fact that the entire tops were covered, and not the roots only. But it is evident that if fruit is retarded in this way the mulching must be done cautiously, for if sufficient covering is applied to delay the vegetation very long the young growth is apt to be injured. Nevertheless, this can sometimes be practiced with good effect, and in this bulletin the experience of nearly a score of well-known fruit-growers is given, nearly all of whom have been able to retard or prolong the strawberry season for from two days to two weeks by mulching.

The most successful practice seems to have been that of Mr. R. M. Kellogg, of Ionia, Michigan. He selects a situation on a northern slope, chooses a late variety, and does not mulch until midwinter when the ground is frozen deeply. Then between the rows he places a heavy coat of coarse manure and treads it down compactly, taking care, however, not to let it lie directly on the plants. Immediately over the plants he puts a rather thin layer of chaff and over this a coat of clean straw, which may be six or eight inches deep. This is allowed to remain until the fruit of the other plants is almost matured, when enough of the straw is raked off to see the plants and give them opportunity to push up through. Sometimes growth will have been started and the foliage may be bleached, but no injury has ever resulted. Mr. Kellogg has often found the ground frozen hard when unmulched plants were in full bloom. In this way he has raised some of his largest crops, and his latest pickings have been more than two weeks after the varieties so treated were all gone.

New York. *F.*

The European Eryngiums.

OUR European Sea Hollies are quite different in habit from your American kinds, whose linear leaves and robust stalks, bearing more or less small white flower-heads, give them an appearance altogether distinct from ours. They belong to the family of Umbelliferæ; all are perennials, with coriaceous, toothed, cut or lobed leaves and bluish bracted flowers closely sessile in dense heads, the heads being surrounded with an involucre more or less deeply and finely cut, and becoming generally blue before, during and after the flowering time. These involucres are the most conspicuous part of the plant, and many people mistake them for the flower-petals, just as they do in the case of the Edelweiss. The stems of the upper part of the plants generally become blue, like the involucre, at the same time, and are among the handsomest objects in all the plant world. They are generally scariose, so that they can be preserved for the winter like the everlasting flowers, and are of great use for winter and market bouquets. In the Jardin Alpin d'Acclimatation, in Geneva, we now cultivate fourteen different kinds of hardy Eryngiums, all belonging to the "Blue Thistle" group, so called on account of the color and of the spiny character of the plants.

Eryngium alpinum is a very rare species found on chains of the Alps in Switzerland, Savoy and Tyrol. It is a neat and curious plant, two or three feet high, with heart-shaped leaves, not cut at all, and borne on long petioles. It bears one to three heads of flowers and a marvelously cut involucre, very finely incised and of the deepest blue. The upper leaves and the superior part of the stems are of the same color, and hold that curious bluish tint when cut and preserved for the winter. The flower-heads are large, and the involucre measures more than four inches in diameter. The flowers appear from June till August. A good deep soil and a partially shaded situation suit it best. It is reproduced only from seed. It is one of the best of alpine plants either for the herbaceous border or for the rockery. It has been said that E. alpinum grows upon the Rocky Mountains, but neither in Bossier's herbarium, De Candolle's nor Delenert's, nor yet in Asa Gray's books do I find any mention of this fact. Until some American reader corrects me, I shall assume that this plant is not itself American.

In the Pyrenees the genus Eryngium is represented by quite another species, E. Bourgati. The plant is hardly a foot high, has very deeply incised and divided, rough and spinescent leaves of a bluish or whitish green, and very strongly nerved. The flower-heads are not so large as those of E. alpinum, and are whitish; the involucre is of quite another character, and formed of spinescent, narrow and very hard leaflets, bearing a thorn at their summit, and becoming pale blue at flowering time, which is June till August. It endures well the hottest sun.

The highest summits of Sierra Nevada and Morena, in Spain, give us another very interesting Eryngium, called E. glaciale. It grows upon barren summits between 7,000 and 9,000 feet in altitude, and is very rare in gardens. It has a dwarf habit, not more than eight inches high, and bears from one to three flower-heads, surrounded with an involucre of the same character as that of E. Bourgati. The leaves have long petioles, are whitish nerved, spiny and deeply cut. Its flowering season is June and July, and it needs a rockery with a sunny aspect. The stems and involucre become bluish from May to the end of July. It can be increased only from seed.

The chains of the Apennines and of the southern Alps, in Tyrol and Croatia, give us the fine E. amethystinum. Its leaves, with whitish nerves, are very deeply cut, long and linear-lanceolate. The flower-heads, borne on stems two feet long, are surrounded by an involucre with five to six leaflets, which are spinescent, linear-lanceolate and of a deep amethystine-blue. The flower-heads are not so large as those of the preceding species, but they are very numerous and form a corymb. The stems, involucre and leaves in the summertime are all quite blue.

If we go into Turkey over the Balkans, or into Greece, we find the interesting E. Creticum. The growth of this plant is quite distinct, as the stems at half their height suddenly divide into many branches, so as to form an umbrella-shaped top. The branches are of the deepest blue, and the very numerous little heads are set in spiny blue involucres. This plant needs full sun and dry sandy soil. In the Caucasian mountain-meadows we find the elegant E. giganteum, which is somewhat analogous to E. alpinum, but differs from it in its leaves, which are more ovate and elongated, and in the involucre, which is not cut, but toothed only, spinescent and of a very hard and leathery texture.

In the Taurus and Libanus ranges we find E. falcatum with ovate, entire, radical and often trilobate leaves and a stem three and a half feet high, bearing numberless small heads of flowers with spinescent little involucres, which are blue from June to September. It grows freely in any sunny place. E. plenum grows in Siberia and the Ural Mountains, and differs from E. falcatum by having its radical leaves cordate, with long petioles, and never trilobate, and having also the bracts of the involucre narrower and longer. In Asia Minor there are three important Eryngiums—E. Olivierianum, a tall-growing species with very hard leathery involucres; E. cœruleum, which extends to the alpine heights of the Himalayas, and E. multifidum, nearly allied to E. amethystinum. There are three other European kinds which are worth cultivating, although their stems do not turn blue. These are E. maritimum, a glaucous species, growing by the sea-shore; E. spino-alba, of the Cevennes Mountains, and E. vulgare.

All these Eryngiums are interesting and well worthy of cultivation. They grow so easily from seed that it would be very easy to introduce them into America, where they would certainly prove valuable, since they endure the hardest winters as well as the hottest and driest summers. They all are very easy of cultivation here in our garden at Geneva.

Geneva, Switzerland. *H. Correvon.*

Winter Care of Hardy Plants.

HARDY hybrid Primulas and occasional Daisies are now about the only flowers to be found in the garden, these sturdy plants giving flowers in all but the hardest weather. It is now the season when the hardy plantsman, having housed his doubtful plants, must decide as to what protection, if any, shall be given to the main collection. Owing to the multiplicity of plants and the varying tastes of cultivators it is impossible in a short article to speak except in a general way on this subject, and these general remarks must, of course, be subject to modification according to climate and special exposures. Here, near the sea, we have a most erratic climate, often an open season, except for a few weeks during the winter, and again, for variety, nature covers us with snow for months; not often, however. After some experience and many experiments I protect neither herbaceous plants or bulbs except in very exceptional cases. If there is any doubt about a hardy plant being well-established, it is well to mulch it as a precaution, though it does not seem to me even desirable to protect those plants having soft evergreen leaves, except by working under the foliage some small sharp stones or in some cases well-rotted manure. While a thin layer of fibre or fine manure on a bulb-bed will protect the flowers in the spring from being splashed with mud, yet a protective mulch is only necessary for most hardy bulbs when they have been planted too late to make proper progress before winter opens. In such cases a warm coating is a necessity in this climate. Most Lilies, also, are better for a warm mulch, being often injured by excessive freezing. There are other bulbs, as Calochorti, which, while hardy, are injured by excessive moisture, and these may be protected by a sash or boards to shed water. The great enemies of hardy plants are moisture, long-continued freezing and frequent freezing and thawing, to which may be added, in case of Carnations, the harsh drying winds of the early year; a slight covering of evergreen boughs will be efficient over the latter plants. Lath shadings, or shade of picket-fences, will obviate much of the trouble from shifty weather. It is often the custom to cover beds in the fall with rich manure, but it would seem that the best time to feed plants is when they are growing and need it. The plants which give me the most anxiety are those which are planted on a sunny border which is protected by the house also. Such plants as make early growth here require a protection of Oak or other hard leaves, otherwise the constant freezing and thawing creates havoc. An occasional plant like Arundo donax, which is not invariably hardy, but which is difficult to move, may have a covering of unsifted ashes with advantage, as these, when frozen, throw off moisture most perfectly. Hollyhocks are among the commonly grown plants the most difficult to winter. These are often victims of neglect, however, the old stems rot and make lodging-place for water, which quickly ruins the plants. They should be gone over in the fall and old dead wood cut out and ground opened around the clumps for drainage. Then they will usually winter perfectly. Small plants with hardy foliage, like some Androsaces and some of the Saxifrages, suffer from moisture, and in such cases a pane of glass fastened over the plants with wires will protect them perfectly. In short, a collection of hardy plants requires, not only in culture, but in protection, to be studied individually.

Elizabeth, N. J. *J. N. Gerard.*

Luculia gratissima.—The Luculias are among the good old plants of sterling merit which have been neglected for newer introductions. They are too rarely seen, but those who possess good plants would be sorry to part with them, for they bear a sure crop of beautiful fragrant flowers every year about Christmas. Two years ago some well-grown branches were exhibited in Boston, and much surprise was expressed because a plant of such merit was so little known. The flower-heads are large, not unlike those of Hydrangea, pink in color, and very fragrant. An intermediate house is the proper place for L. gratissima, as it likes plenty of sun; indeed, ours has been in the Rose-house all summer, and now every branch is terminated by a cluster of flower-buds. The Luculias do not need a large root-run, though I have seen them grow and flower splendidly planted out, in which case their situation must be carefully selected. Careful attention is necessary as to watering, for the roots are exceedingly fine and hair-like, and will not endure drought. After the flowering season is past the plants will require pruning to keep them in good shape, especially after the plants attain some size. The scarcity of the plant is in a measure due to the difficulty of multiplying it. Seeds are hard to obtain, and seedlings require years to flower; while cuttings are difficult to root, but flower the first year. Cuttings should be taken from well-ripened shoots and closely cared for in a propagating-case. A sharp watch should be kept so that insects do not infest the cuttings before they are rooted, red spider being especially fatal to success. The Luculia belongs to the Cinchona, or Quinine-bark, family, and the name itself is the Nepalese name of the tree Latinized.

Oncidium ornithorhynchum.—Mexican Orchids for the most part take very kindly to cultivation here in the United States, and this Oncidium is one of the most tractable. It appears to thrive equally well in the cool-house or in a warmer one, and our success with a plant originally presented induced the purchase of twelve others, more especially because of their agreeable spicy, but quite undefinable fragrance. The original plant was obtained two years ago in a four-inch pot, and owing to the way the plant has of making two growths each year from the last-made bulb, it is now in a nine-inch pan and a fountain of charming pink flowers; the spikes are much branched, many of them two feet long and the foliage of a rich green. There is a white form of this Oncidium, at present extremely rare in cultivation, but very beautiful. O. ornithorynchum is an easy plant to grow and appears to need no resting period, as the young growths start before the flowers have faded each year, and the bulbs increase in size until they become as large as hens' eggs, and these produce two the next season. Repotting is done directly after the plants have past flowering, that is, during the fall months. We have had plants in bloom now for three months, and the small sprays are very useful for boutonnières because of their airy grace and fragrance. The specific name of this Oncidium has reference to the peculiar appendage to the anthers, which seem to resemble a bird's beak.

South Lancaster, Mass. *E. O. O.*

Liatris grammifolia.—This plant has an important variety, the variation seeming to be the result of growing near the seashore. The ordinary form is quite common here, and is one of our finest native plants, flowering with the Asters and later Golden-rods, after most plants have gone out of bloom. But Liatris grammifolia, var. dubia, which I have recently found in considerable numbers in Cape May County along the sandhills of the coast, is a great improvement on the type. It is a stronger plant, with extremely leafy stems, more florets in each head, and the heads set very closely together, so that not infrequently the top of the spike is enlarged into something like a cockscomb shape. Both the species and the variety are greatly improved by cultivation and by pinching or stopping once when six or eight inches high. The plants then grow quite bushy, instead of throwing up a single stem, as they generally do in their wild state. I could hardly name a plant which makes a finer display during a considerable portion of September and October than this Liatris when grown in a mass. Occasionally a pure white variety is found, but quite rarely, and I have not yet succeeded in reproducing it from seed.

Hammonton, N. J. *Wm. F. Bassett.*

Pacific Coast Irises.—Oregon collectors are offering Iris macrosiphon, and describe it as having a cream-colored flower. It is common on the coast-range of northern California and north Oregon, and here it is generally a lilac-purple. I have seen detached clumps which were pure white. In the range east of Ukiah it frequently varies to cream color, and in one locality, within a half mile, it runs from purple through bronze-purple to rich bronze and to cream color. Like all the Pacific coast species, the masses are dense, with root-stocks hard and rather slender. It prefers a gravelly soil in open woods. I have naturalized Iris Douglasiana with success in my Fern-beds, where it shows well with its yellow purple-lined flowers. It runs through the eastern edge of the Redwood belt. I. Hartwegii is a somewhat similar species with yellow flowers, found in the open woods of the Sierra, and flourishing in the peculiar dry, red, granulated soil.

Ukiah, Calif. *Carl Purdy.*

The Dandelion as a Salad-plant.—This plant affords one of the earliest and most healthful of spring greens, and as soon as the

snow disappears in all suburban regions great numbers of people are seen wandering over vacant lots and by road-sides watching for the first signs of its growth. It is usually not difficult to get a basketful, for the Dandelion is the most persistent of weeds. Although rarely cultivated in this country, it is extensively grown in England, and particularly in France, where varieties have been improved by selection. These improved kinds are grown just as Carrots and Salsify and other roots, and being perfectly hardy, they can be always trusted to produce a crop of spring greens, but they can be blanched if it is preferred. It is most esteemed, however, as a salad-plant, and good varieties of it resemble the finest sorts of Endive. If the roots are dug in the fall and stored in a cool place they can be as easily forced in the winter-time as Sea-kale. The roots should be set some three inches apart in pots or boxes, with the crowns just above the soil. After a good soaking of water is given to settle the soil around the roots, they should be placed in a Mushroom-house or in a cellar where the temperature is kept at about sixty. In the absence of such a convenience, pots may be set under the bench of a greenhouse or any other warm position, with the crowns covered by inverted pots to exclude the light. By successive plantings a convenient supply can be had during the winter and spring.

Dongan Hills, N. Y. *Wm. Tricker.*

Correspondence.

Chrysanthemums at the Exhibitions.

To the Editor of Garden and Forest:

Sir,—As a practical matter it would be well if more encouragement were given at the shows to plants which, for lack of a better term, may be called naturally grown. By these I mean plants grown from spring cuttings and worked along into, say, eight-inch pots and cut back only once, perhaps, in the case of tall-growing kinds. Such plants, well-cared for, will break freely, and in the fall, being properly disbudded, will give from twelve to twenty-four good flowers, as large as necessary or desirable, and, if the gardener exercises some restraint on himself, will bloom in a pleasing way at varying heights, and not appeal to two senses by their resemblance to a glowing mushroom. Such plants have an educational value in a show as they are examples of what a private grower generally finds most useful—a plant occupying a minimum of space and giving a maximum of results. Anything which will lead more people into the cultivation of flowers is of the first importance at exhibitions.

For my own use, while a believer in quite thorough disbudding of Chrysanthemums, I prefer not to disbud a large plant uniformly, thinking that one which carries an assortment of flowers produced by disbudding to one, two and three flowers on various stems, is the most pleasing and also most useful. Mr. Roehrs had a collection of nicely grown little plants at the New York show, which were in six-inch pots and fairly well furnished with flowers. These, however, were only an approach to my ideal. In a pot one size larger one could secure many times the result and effect. As we have had a warm season this year, the flowers have shown the advantage of having escaped the usual amount of fire-heat by being firmer and more lasting. It is the unfortunate feature of this fine, hardy plant that it flowers at a season when some fire-heat is necessary for its protection, if it is to be grown to mammoth size. Nothing puts these flowers out of character so soon as heat, while glass seems to have a surprisingly slight effect in improving their color.

To one who examined critically a great many white flowers at the recent show nothing was more surprising than the scarcity of a pure white color among them as seen in daylight. Almost all the whites showed a trace of pink, green or some degrading color. In respect to purity the Queen was the premier flower shown here. One hesitates to speak about the new Chrysanthemums and offer an opinion as to what gains have been made in recent years. There are a great many flowers certificated, and one cannot judge harshly the owner who thinks a plant at a dollar a vast improvement on one at ten cents. Beauty of form is a matter of opinion, and we will put that aside. In color we have gained some good dark crimsons in shades not previously had in such flowers as George W. Childs and Emily Ladenburg. In yellows we have a larger number, but no better shades than old Thunberg or Golden Dragon; we have more whites, but no purer tones. The old Bouquet Fait was a pink hard to excel, but we have larger flowers now. When it comes to size, the ancients were nowhere, apparently, but really no one knows how large many of the old varieties could be grown. They have never had a chance. There have been at least four thousand varieties of Chrysanthemums put into cultivation in the last fifteen years, though many of them have had small distribution. When we remember how few persons have been growing these large blooms, and how small the number of varieties experimented with, it is plain that all the facts about the various kinds are by no means understood.

It will not be disputed that we are making gradual and steady gains in good forms, mostly in American seedlings, with occasional Japanese importations, and a still rarer European one. Nevertheless, it is unfortunate that the mania for new things has led to such a rapid discarding of good and well-proved old varieties, many of which do not seem to survive even in florists' catalogues. I presume, however, that numbers of these still remain as established favorites in quiet gardens, where the pulsation of the flower-show never beats. I hope, also, that in these quiet places there are many of those quaint, dainty forms—freaks, if you will—which help to distinguish the Chrysanthemum as one of the most remarkable plants for variation of form, coloring and general effectiveness. There does not seem a possibility that it will ever occupy a less prominent place in the affections of flower-lovers. It is unique and invaluable in that it flowers at a time when other flowers are scarce, and blooms at that dull season so abundantly as to fill the wildest desires for flowers and color.

Elizabeth, N. J. *J. N. Gerard.*

Notes from Northern California.

To the Editor of Garden and Forest:

Sir,—Early November brought some sharp frosts to cut down tender plants like Cannas, but the fall bloom of our Roses has been uncommonly good and they are still blooming freely. One is reminded every season that each Rose has its likes and dislikes, and the favorite now may disappoint us next year. I admire Madame de Watteville, but from several strong bushes I have not had a really good specimen flower this year. Puritan I have thrown away after a long trial, and Waban refuses to be a success here. Madame Hoste is admirable and stands the heat wonderfully well, as did the Viscountess of Folkestone. Paul Neyron never blooms freely, but it can always be counted on to produce a few fine flowers, and the new Rainbow has taken a high rank. The two most satisfactory Roses this summer with me have been a large plant of Cloth of Gold, and another of William Allan Richardson, trained on trellises. Their early bloom was perfect, and there has hardly been a day since when fine Roses could not have been picked from both of them. On this 9th of November the Cloth of Gold has perfect flowers of the largest size. From late sowings of Sweet Peas we are still getting fine flowers. Anemone Japonica is our most beautiful and useful white flower at this season, and what a splendid flower it is for shady places. Pansies which have lived through the summer heat are now flowering freely. Those from seed sown in late summer will give a good account of themselves all through the winter.

I have been reading with interest the discussions in your columns as to the feasibility of growing Dutch Bulbs for market in the southern states. I am one of the dreamers who believe that it will be done here in the near future in California. Narcissi could be grown even now cheap enough to compete with imported bulbs, and there is every reason to suppose that the quality would be superior. My experiments lead me to believe that the drawback to success is not that of soil, or climate or expensive labor, but a lack of skill, which we shall acquire in time. Californian horticulturists have accomplished so much in the short history of this state that we may be pardoned for our readiness to attack any new problem.

Ukiah, Calif. *Carl Purdy.*

Mid-November in a Michigan Garden.

To the Editor of Garden and Forest:

Sir,—We hardly expect to find much in our garden at this season, but on the morning of the 14th we gathered some Sweet Alyssum, some Pansies and some Mignonette, which made a nosegay whose fragrance could not have been excelled at any time of the season. But, although flowers are rare, and although, as I notice in my daily rides, the woods have lost their glory, our shrub borders are still making beautiful pictures with their rich and ever-changing colors. A mass of Spiræa Thunbergii now shows marvelous harmonies in brown, red and yellow, with subtle changes as the sunshine filters through the fine leaves. Near by, Berberis Thunbergii is a mass of glowing scarlet which lightens up the whole bor-

der. Spiræa prunifolia is still beautiful in its lower tones, although it was at its best three weeks ago. The variegated Philadelphus gives at this date the best foil to these colors, and its golden color still glows as if nothing had happened to it. I ought not to neglect in this enumeration the fresh green color in the herbaceous border, where the Ascension Lilies, some clumps of Aquilegia and Cranesbill and one of Wood Anemone are still bright, and freshest of all a mass of native Ferns, whose fair color and delicate forms were never more attractive than now.

Overisel, Mich. *H. A. Fortuine.*

Chrysanthemums in Vases for Competition.

To the Editor of GARDEN AND FOREST:

Sir,—Allow me to correct Mr. Gerard in one point. In his interesting article on Chrysanthemums for competition, he states that the scheme of showing large vases of one variety on long stems was inaugurated three years ago at Madison Square Garden, and has since spread to all parts of the country. I wish to say that this method of exhibiting prevailed in Boston several years before any Chrysanthemum-show was ever held at Madison Square Garden. The exhibitors at the autumn flower-shows of the Massachusetts Horticultural Society are entitled to whatever credit there is for discarding the plan of exhibiting Chrysanthemums on flat boards and introducing the use of tall vases and long-stemmed blooms.

Boston, Mass. *Wm. J. Stewart.*

Recent Publications.

A History of Hingham, Massachusetts. Published by the Town: 1893.

The ancient town of Hingham, in Massachusetts, one of the oldest in the commonwealth, as it dates from 1633, has recently published its history in four handsome volumes, liberal appropriations having been voted from time to time by the citizens during the last ten years for this purpose. A list of the native and naturalized plants found growing within the limits of the town, prepared by Mr. Thomas T. Bouvé, will be found in the first volume. Mr. Bouvé has further enriched this volume with important chapters upon the geology and mineralogy of the town, and with another on the animals of Hingham, while his son, Mr. Edward T. Bouvé, has written a chapter devoted to Hingham Trees and Shrubs.

The flora of Hingham shows what would seem a curious absence of several northern plants common on the north shore of Massachusetts Bay, a few miles distant, were it not remembered that the north shore is influenced by cold ocean currents flowing between it and the Gulf Stream, which reduce the temperature, and in providing favorable conditions for boreal species restrict the spread northward of southern species. Some of these are able to maintain themselves in Hingham, situated south of a sheltered land-locked bay and in the path of the prevailing south-west summer winds blowing from the Gulf Stream directly across the heated sands of Cape Cod.

The nomenclature and arrangement of the last edition of Gray's *Manual of the Botany of the Northern United States* is adopted, and no attempt to supply the reader with the synonymy of the different species is made, as the author has, no doubt, decided that all questions of the names of plants, except as they appear in the standard work on the subject, would be out of place in a popular book of this character. In the list, which is confined to flowering plants and to vescular cryptogams, are included plants of ninety-five families, and to each family Mr. Bouvé has appended some useful notes upon the properties, uses and distribution of its members, which add materially to the value and practical use of his chapter, especially as in these introductory notes he tells of the principal plants of each family which are cultivated in the fields and gardens of the town. Just north of the borders of Hingham the Holly, Ilex opaca, finds its most northern home; and here, too, and on the not distant southern slopes of the Blue Hills, the highest land in eastern Massachusetts, the Rock Chestnut Oak, Quercus Prinus, finds the eastern limits of its range; but it is surely through error that the narrow-leaved Chestnut Oak, which Mr. Bouvé, following Engelmann, calls Quercus Muhlenbergii, is admitted here. Unless we are misinformed, this beautiful tree, one of the most distinct of our Oaks, has not wandered further east from its home in the middle and western states than the western bank of the Hudson River, where, near Newburgh, in this state, it may be occasionally encountered. Of Cratægus, only C. coccinea is admitted, although we should have expected to find, in Hingham, Cratægus mollis, which is, perhaps, the commonest Thorn in eastern Massachusetts, where it sometimes grows to a large size, and where in early autumn it is conspicuous with its large apple-like scarlet fruit. Mr. Bouvé's statement, that "the leaves of Rhododendron and Kalmia contain a narcotic principle which sometimes renders them poisonous," must be accepted with caution, at least, so far as our species are concerned, which, apparently, do not deserve the bad reputation which was early fastened upon them, although some of the Indian Rhododendrons undoubtedly are injurious to animals browsing upon their leaves; and honey made from the flowers of others, and from some Azaleas, possess narcotic or poisonous properties. Occasional slips of the proof-reader in using Roman type for italics make some introduced plants appear to be native to the town. It is interesting to learn that the red-berried Elder, which is one of the commonest plants in northern New England, is only known in Hingham in a single indigenous individual, and that the Rose Mallow, Hibiscus Moscheutos, although it is common enough a few miles away on the banks of the Charles River at Dedham, and with Lythrum Salicaria, another plant only found in Hingham in a single locality, fills the swampy inlets of the eastern bank of the Hudson between Newburgh Bay and Albany and the great meadows back of Jersey City.

All our readers will join in Mr. Bouvé's plea for the preservation of the rare plants of Hingham, and, indeed, of every other town, from one end of the land to the other. His caution in not printing the exact localities where the different species are to be found will check the greed of amateur collectors and so-called botanists, who pounce upon and eradicate any plant which they are told is exceptionally rare or interesting. And to those who know the beauty of a New England road-side and the capacity of a New England road-master to turn this beauty into a howling wilderness of desolation, Mr. Bouvé's appeal for relief from his senseless tyranny will be as balm to the weary spirit; and we cannot do our readers a greater favor than to reproduce it in full, for it treats of an abuse which it is perfectly possible to avoid if one or two energetic persons in a town will take up the matter of preserving the beauty of its roads and insist that ignorant workmen shall not be allowed to destroy it:

> It is not only for the preservation of the exceedingly rare plants of the town that the writer would plead. Quite as earnestly would he urge that the transcendent beauty which is often presented along the sides of the roads, especially of those bordered by forest-growths, may be allowed to display itself and gladden the eyes and heart of the wayfarer. Yearly many of these roads are adorned with flowers of varied hue, charming to every beholder. In the spring the modest Violet, the delicate Anemone and the showy Buttercup open their petals to the light. As the summer's sun 'starts full perfection through the swelling year' the Wild Rose, the Eglantine, the Elder and and many other species display their loveliness and exhale their fragrance. Then follows autumn, and everywhere there start up to beautify our highways the many Asters and Goldenrods, and it is just when these expand in gorgeous loveliness, outrivaling all that man can produce by the most consummate art, that the destroyer comes and sweeps them away in a day.

We have only been able to glance at the other chapters in this work, but if they are as interesting and valuable as those devoted to botany, the town has reason to be proud of the ability of its citizens to maintain its good name and ancient fame.

Notes.

Mr. John Weathers, whose notes on Orchids have from time to time appeared in Garden and Forest, has made a large collection of drawings of new and interesting plants during his connection, first with Kew, and now with the Royal Horticultural Society. These drawings, with others, Mr. Weathers now proposes to publish under the title of *The Floral Sketch-book*. The book will be published monthly, and each number will contain five figures of plants, with full descriptions and historical and cultural notes. The first number will be ready in January next. The price will be one shilling.

Japanese persimmons, from Florida, make altogether the brightest show among seasonable fruits, and this delicious dessert and breakfast fruit is now in perfect condition. The final receipts of California grapes are expected at the end of this week. Among the varieties in recent arrivals are Black Morocco, a large, fleshy, black berry of rather inferior quality, but a showy market fruit, which stands shipment well, and the oblong yellowish-green Verdel, lacking in sweetness, but useful as a late table grape. The first California Navel oranges are now being put on the market in that state, but this fruit will hardly reach eastern cities until toward the close of the season for Florida oranges. Hot-house tomatoes are already coming in from neighboring greenhouses and bring sixty-five cents a pound.

Mr. A. M. Herr, an authority on the cultivation of Carnations, gives it as his opinion, in a recent number of the *American Florist*, that the growing of Carnations for flowers and for propagation should be two distinct processes. When the same plants are used for both purposes there will be loss on one side or the other. Beyond question, the flowers can be increased in quality by very high culture, and it is equally true that this same culture is prejudicial to the health of the plant, and if such plants are used for propagation they will in a few generations become feeble and liable to fall a prey to disease. On the other hand, if plants are grown for the production of strong cuttings, the flowers must suffer in quality, and they cannot be above a medium grade. But even in the trade the best pays the best in the long run, and the comparative loss in the quality of the flowers will be more than compensated by clear gains in quality from better plants next year.

A correspondent writes to the *Florists' Exchange* that the best varieties of Odontoglossum crispum have been found, so far, in a comparatively small range between the fourth and fifth degrees of northern latitude on the western slope of the eastern Cordilleras, and at an elevation of 6,000 to 7,000 feet. The plants grow higher up the mountains, and farther north and south, but when found at an elevation of 9,000 feet they are smaller, with more decidedly pear-shaped bulbs, which shrivel a great deal when they are dried off. At the elevation of 9,000 feet the temperature sometimes falls to forty-two degrees, Fahrenheit, while at 6,000 the thermometer never registers less than fifty-five degrees. O. crispum is fond of light and air, and, therefore, does not grow in the dense woods, but on the edges of openings, where it can receive sunlight and enjoy the breezes. This is why it seems to follow the little streams and gullies in the mountains which, apparently, split the forests open. It grows on the thick limbs and crotches of large trees, such as the Chinonas and Melastomas, and the trees upon which these Orchids are found are cut down without mercy, and the plants are torn off and shipped away.

The Florida lemon season, which commenced early in September, is about ended. Only a small portion of the crop, estimated variously at from 25,000 to 50,000 boxes, came to this city. The percentage of handsome Florida oranges has been small, the bulk being rusty or "horny," and prices have been unsatisfactory to the growers. The average freight on a box of lemons from Florida to New York is fifty cents, while from Sicily the cost for transportation is but thirty-two cents, with duty amounting to as much more. The railroad charges from California on a similar package are eighty-seven and a half cents, but the crop in California is small, and as yet only specimen lemons have been seen here. Nearly three million boxes of lemons came into the United States from Mediterranean ports during last year. The lemon season with local dealers begins November 1st, when the first new Sicily lemons are due, and continues the year through. While the over-importation of Mediterranean lemons last year has left a large supply of old stock on hand, there are just now no good lemons to be had here. During November of last year 120,000 boxes of new-crop Sicily lemons were sold in New York, but none have yet reached this port this season. The first cargo of Messina lemons is, however, expected daily, and another steamer, carrying above 20,000 boxes of the same high grade, is due this week. The crop of Florida oranges this season is the heaviest known, a conservative estimate being 4,500,000 boxes, while it is believed by other authorities that 5,000,000 boxes will go out of that state. The weather in Florida during the summer was highly favorable for the development of the fruit, and many young groves are coming into bearing for the first time. The fruit is ripening earlier than it has for several years past, and is reaching this city in heavy quantities, but prices are very low, due to decay caused by recent rains. Last week there arrived, besides large quantities of the fruit bound for other points, about 60,000 boxes, while the week previous 42,000 boxes were thrown on this market. The heaviest receivers are the Florida Fruit Exchange, who sell the product of above 8,000 growers at auction. An average price of recent sales is $1.60, and this nets the grower but sixty-five cents a box on the tree, the return heretofore having been about a dollar a box. Since the middle of September 25,000 boxes of Florida oranges have been sent to England by the Exchange, with generally satisfactory results.

An interesting bulletin has been prepared by Mark Vernon Slingerland, and published by the Entomological Division of the Cornell Experiment Station, on the Four-lined Leaf-bug (Pœcilocapsus lineatus). Unlike many of our worst pests, this is a native American species, and was described nearly a hundred years ago. It has been brought to attention within the past year or so by its attacks on Currant and Gooseberry bushes, which, after the insects had finished them, looked as though a fire had swept through them, and had left the topmost leaves brown and dead. The death of these leaves so early in the season as the middle of June entirely stops the new growth of the bushes, and although the fruiting portions of the plants are injured little for the current season, the check given for the next year must seriously affect their future bearing capacity. What we wish to speak of, however, now is the interesting fact that Dr. Fitch put it on record as early as 1858 that this insect was seriously injuring Dahlias. Mr. Chatfield, an Albany florist, then stated that upon his plants the first flower-bud which appeared was attacked by the leaf-bug and punctured so that it withered. The two or three stalks which then came forth from the base of this one were destroyed in the same manner. Other stalks put forth from the base of these shared the same fate. The result was an enormously broad mass of leaves and stalks which grew from one root, without a single flower resulting from the multitude of buds which had been developed. In 1864, Mr. Heffron, of Utica, told Dr. Fitch that these bugs had so infested his Dahlias that only three or four imperfect flowers were produced, and that in the neighboring gardens that year the insects had destroyed the flowers on all the Dahlias. Mr. Slingerland says that these facts may give the reason for the failure of the Dahlia to flower in western New York, as noted by Mr. Chamberlain in a letter to Garden and Forest for October 4th, and corroborated by Messrs. Ellwanger & Barry, of Rochester. The evidence offered by Dr. Fitch seems to show that these effects are very similar to those produced on Dahlias by the attacks of this insect. Of course, there is need of more observation on this point. If growers will watch their Dahlias closely next year they can determine whether or not this widespread loss of flowers is due to the punctures of the insect. The four-lined leaf-bug attacks a large number of plants cultivated for food, medicine and ornament, as well as many weeds, and as the insects feed on the juices of the leaves or buds the arsenical applications seem of little avail. It has no biting jaws for masticating its food, but a beak, through which it sucks its food, and this delicately pointed sucker passes through the poison even when it thickly coats the leaf, while the insect does not imbibe any portion of it, but feeds safely on the inner tissues. A strong kerosene emulsion is the cheapest and most effective insecticide for all these sucking insects. It had better be applied on the nymphs as soon as they appear in May, for it will not be so effective on the adults. Inasmuch as the eggs are deposited on the tips of new-grown shrubs, the pruning and burning of these tips on which the eggs are laid is also a practicable means of fighting the pest. This pruning can be done at any time between August 1st and the first of the following May. Another good plan of attack against the adults, especially on herbaceous plants, will be to capture them by jarring them into a dish partly filled with kerosene water. On shrubs like Currants and Gooseberries the nymphs should be captured this way in May. The bulletin is helpfully illustrated and gives a complete summary of all that is known of this pest.